U.S. DEPARTMENT OF COMMERCE
National Technical Information Service
PB-277 365

# Moon Lake
# Duchesne County, Utah

National Eutrophication Survey, Corvallis, Oreg

Prepared for

Corvallis Environmental Research Lab

Oct 77

37

PB 277 365

# U.S. ENVIRONMENTAL PROTECTION AGENCY
# NATIONAL EUTROPHICATION SURVEY

## WORKING PAPER SERIES

**CORVALLIS ENVIRONMENTAL RESEARCH LABORATORY - CORVALLIS, OREGON**

**and**

**ENVIRONMENTAL MONITORING & SUPPORT LABORATORY - LAS VEGAS, NEVADA**

REPRODUCED BY
NATIONAL TECHNICAL
INFORMATION SERVICE
U. S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA. 22161

G.P.O. 699-440

TECHNICAL REPORT DATA
*(Please read Instructions on the reverse before completing)*

| 1. REPORT NO. | 2. | 3. RECIPIENT'S ACCESSION NO. PB277365 |
|---|---|---|
| 4. TITLE AND SUBTITLE<br>Report on Moon Lake, Duchesne County, Utah | | 5. REPORT DATE<br>Prepared October 1977<br>6. PERFORMING ORGANIZATION CODE |
| 7. AUTHOR(S)<br>Anonymous (National Eutrophication Survey Staff) | | 8. PERFORMING ORGANIZATION REPORT NO.<br>Working Paper # 847 |
| 9. PERFORMING ORGANIZATION NAME AND ADDRESS<br>National Eutrophication Survey<br>U.S. Environmental Protection Agency<br>200 S. W. 35th St.<br>Corvallis, Oregon 97330 | | 10. PROGRAM ELEMENT NO.<br>11. CONTRACT/GRANT NO. |
| 12. SPONSORING AGENCY NAME AND ADDRESS<br>Office of Research and Development<br>U.S. Environmental Protection Agency<br>401 M Street, S. W.<br>Washington, DC 20460 | | 13. TYPE OF REPORT AND PERIOD COVERED<br>Final - 1975<br>14. SPONSORING AGENCY CODE |

15. SUPPLEMENTARY NOTES
Prepared in cooperation with the U.S. Environmental Protection Agency, National Environmental Research Center, Las Vegas, Nevada 89114

16. ABSTRACT

Annual total phosphorus and total nitrogen loadings to the lake were estimated and subdivided according to either point or non-point source origin. An assessment of the lake's trophic condition and limiting nutrient is also provided. All data collected by the U.S.E.P.A. National Eutrophication Survey during the one year study of the lake and its tributaries are included in the report.

17. KEY WORDS AND DOCUMENT ANALYSIS

| a. DESCRIPTORS | b. IDENTIFIERS/OPEN ENDED TERMS | c. COSATI Field/Group |
|---|---|---|
| eutrophication<br>lakes<br>nutrients<br>phosphorus<br>nitrogen<br>loading | | 48G |

| 18. DISTRIBUTION STATEMENT | 19. SECURITY CLASS (This Report) | 21. NO. OF PAGES |
|---|---|---|
| Release unlimited | | 37 |
| | 20. SECURITY CLASS (This page) | 22. PRICE<br>PC-A03/MF-A01 |

EPA Form 2220-1 (9-73)

# REPORT
# ON
# MOON LAKE
# DUCHESNE COUNTY
# UTAH
# EPA REGION VIII
# WORKING PAPER No. 847

WITH THE COOPERATION OF THE
UTAH STATE DIVISION OF HEALTH
AND THE
UTAH NATIONAL GUARD
OCTOBER, 1977

# CONTENTS


| | Page |
|---|---|
| Foreward | ii |
| List of Utah Study Lakes and Reservoirs | iv |
| Lake and Drainage Area Map | v |
| **Sections** | |
| I. Conclusions | 1 |
| II. Lake and Drainage Basin Characteristics | 3 |
| III. Lake Water Quality Summary | 4 |
| IV. Nutrient Loadings | 8 |
| V. Literature Reviewed | 12 |
| VI. Appendices | 13 |

# FOREWORD

The National Eutrophication Survey was initiated in 1972 in response to an Administration commitment to investigate the nationwide threat of accelerated eutrophication to freshwater lakes and reservoirs.

## OBJECTIVES

The Survey was designed to develop, in conjunction with state environmental agencies, information on nutrient sources, concentrations, and impact on selected freshwater lakes as a basis for formulating comprehensive and coordinated national, regional, and state management practices relating to point-source discharge reduction and non-point source pollution abatement in lake watersheds.

## ANALYTIC APPROACH

The mathematical and statistical procedures selected for the Survey's eutrophication analysis are based on related concepts that:

a. A generalized representation or model relating sources, concentrations, and impacts can be constructed.

b. By applying measurements of relevant parameters associated with lake degradation, the generalized model can be transformed into an operational representation of a lake, its drainage basin, and related nutrients.

c. With such a transformation, an assessment of the potential for eutrophication control can be made.

## LAKE ANALYSIS

In this report, the first stage of evaluation of lake and watershed data collected from the study lake and its drainage basin is documented. The report is formatted to provide state environmental agencies with specific information for basin planning [§303(e)], water quality criteria/standards review [§303(c)], clean lakes [§314(a,b)], and water quality monitoring [§106 and §305(b)] activities mandated by the Federal Water Pollution Control Act Amendments of 1972.

Beyond the single lake analysis, broader based correlations between nutrient concentrations (and loading) and trophic condition are being made to advance the rationale and data base for refinement of nutrient water quality criteria for the Nation's fresh water lakes. Likewise, multivariate evaluations for the relationships between land use, nutrient export, and trophic condition, by lake class or use, are being developed to assist in the formulation of planning guidelines and policies by EPA and to augment plans implementation by the states.

ACKNOWLEDGEMENT

The staff of the National Eutrophication Survey (Office of Research and Development, U.S. Environmental Protection Agency) expresses sincere appreciation to the Utah Department of Social Services and the Utah Department of Natural Resources for professional involvement, to the Utah National Guard for conducting the tributary sampling phase of the Survey, and to those Utah wastewater treatment plant operators who voluntarily provided effluent samples and flow data.

The staffs of the Bureau of Water Quality of the Division of Health and the Division of Wildlife Resources provided invaluable lake documentation and counsel during the Survey, reviewed the preliminary reports, and provided critiques most useful in the preparation of this Working Paper series.

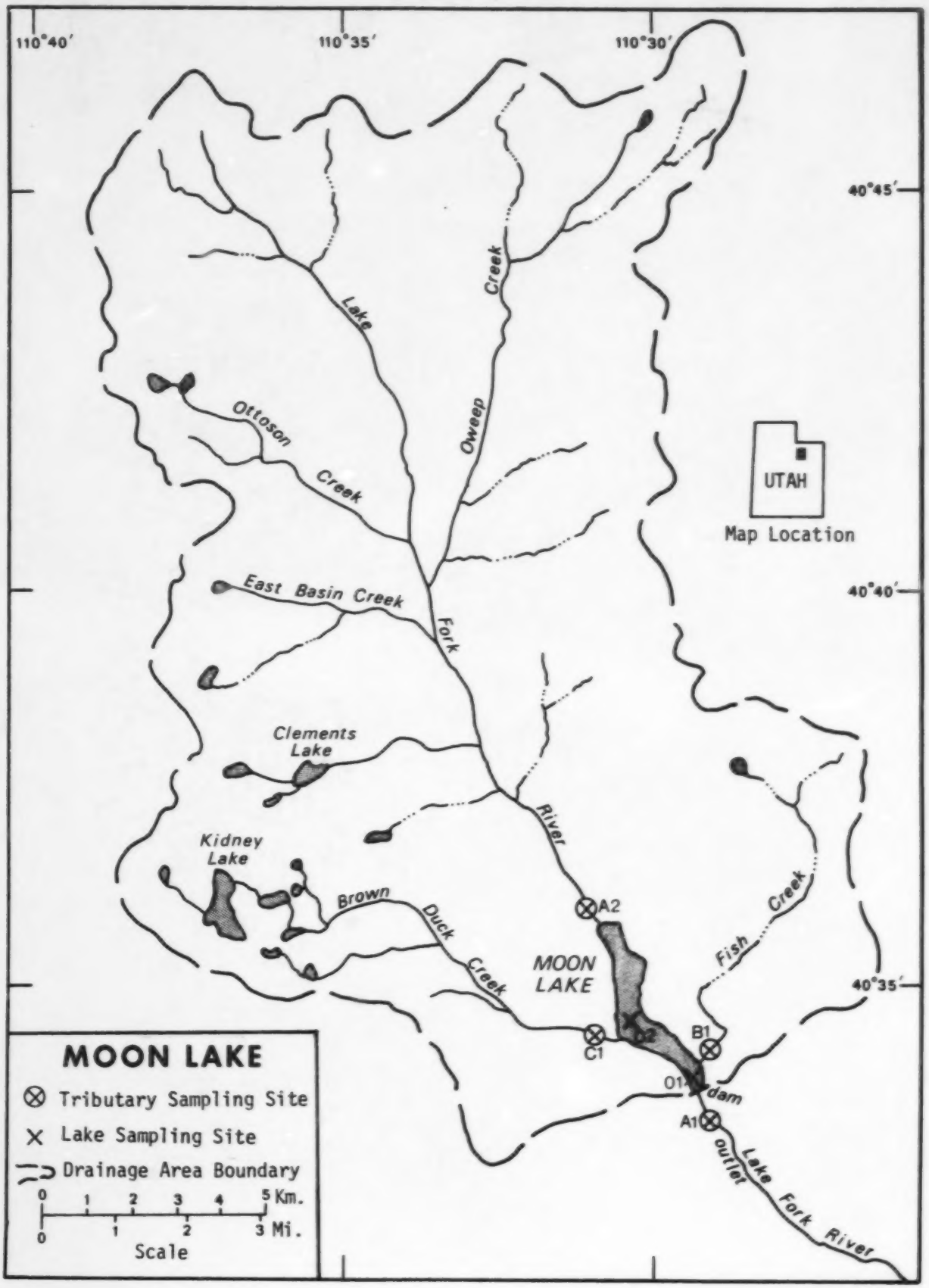
Major General Maurice L. Watts, the Adjutant General of Utah, and Project Officer Lt. Colonel T. Ray Kingston, who directed the volunteer efforts of the Utah National Guardsmen, are also gratefully acknowledged for their assistance to the Survey.

# NATIONAL EUTROPHICATION SURVEY

## STUDY LAKES AND RESERVOIRS

### STATE OF UTAH

| NAME | COUNTY |
|---|---|
| Bear | Rich, UT; Bear Lake, ID |
| Deer Creek | Wasatch |
| Echo | Summit |
| Fish | Sevier |
| Flaming Gorge | Daggett, UT; Sweetwater, WY |
| Huntington | Emery |
| Joes Valley | Emery |
| Lower Bowns | Garfield |
| Lynn | Box Elder |
| Minersville | Beaver |
| Moon | Duchesne |
| Navajo | Kane |
| Newcastle | Iron |
| Otter Creek | Piute |
| Panguich | Garfield |
| Pelican | Uintah |
| Pineview | Weber |
| Piute | Piute |
| Porcupine | Cache |
| Powell | Garfield, Kane, San Juan, UT; Coconino, AZ |
| Pruess | Millard |
| Sevier Bridge | Juab, Sanpete |
| Starvation | Duchesne |
| Steinaker | Uintah |
| Tropic | Garfield |
| Utah | Utah |
| Willard Bay | Box Elder |


110°40'
110°35'
110°30'
40°45'
40°40'
40°35'
Lake
Creek
Oweep
Ottoson
Creek
East Basin Creek
Fork
Clements
Lake
Kidney
Lake
Brown
Duck
Creek
River
MOON
LAKE
Fish
Creek
A2
B2
B1
C1
O1
dam
A1
outlet
Lake Fork River
UTAH
Map Location
MOON LAKE
Tributary Sampling Site
Lake Sampling Site
Drainage Area Boundary
0 1 2 3 4 5 Km.
0 1 2 3 Mi.
Scale

MOON LAKE

STORET NO. 4910

# I. CONCLUSIONS

## A. Trophic Condition:

Survey data indicate that Moon Lake is oligotrophic. It ranked third in overall trophic quality when the 27 Utah lakes and reservoirs sampled in 1975 were compared using a combination of six parameters*. None of the other water bodies had less median total phosphorus or dissolved orthophosphorus, none had less but ten had the same median inorganic nitrogen, six had less mean chlorophyll a, and seven had greater mean Secchi disc transparency. No significant depression of dissolved oxygen occurred at depths as great as 40.2 meters.

## B. Rate-Limiting Nutrient:

The algal assay results indicate the lake was phosphorus limited in September. The lake data indicate phosphorus limitation at all sampling stations and times.

## C. Nutrient Controllability:

1. Point sources--No known point sources impacted Moon Lake during the sampling year.

2. Non-point sources--Non-point sources contributed the entire phosphorus loading to the lake during the sampling year. The Lake Fork River contributed about 76% of the total load, and Brown Duck Creek contributed about 13%.

---

* See Appendix A.

The estimated phosphorus loading of 0.52 $g/m^2/yr$ is less than that proposed by Vollenweider (Vollenweider and Dillon, 1974) as an oligotrophic loading (see page 11). Management of the lake should be directed toward prevention of any increase in the existing loading.

## II. LAKE AND DRAINAGE BASIN CHARACTERISTICS†

### A. Morphometry††:

1. Surface area: 3.12 kilometers$^2$.
2. Mean depth: 14.1 meters.
3. Maximum depth: 22.2 meters.
4. Volume: 44.110 x $10^6$ m$^3$.
5. Mean hydraulic retention time: 140 days (based on outflow).

### B. Tributary and Outlet:
(See Appendix C for flow data)

1. Tributaries -

| Name | Drainage area (km$^2$)* | Mean flow (m$^3$/sec)* |
|---|---|---|
| Lake Fork River | 202.0 | 3.280 |
| Fish Creek | 25.9 | 0.177 |
| Brown Duck Creek | 36.3 | 0.264 |
| Minor tributaries & immediate drainage - | 22.8 | 0.105 |
| Totals | 287.0 | 3.826 |

2. Outlet -

| | | |
|---|---|---|
| Lake Fork River | 290.1** | 3.650 |

### C. Precipitation***:

1. Year of sampling: 18.1 centimeters.
2. Mean annual: 18.9 centimeters.

---

† Table of metric conversions--Appendix B.
†† Sudweeks, 1975.
* For limits of accuracy, see Working Paper No. 175, "...Survey Methods, 1973-1976".
** Includes area of lake.
*** See Working Paper No. 175.

## III. WATER QUALITY SUMMARY

Moon Lake was sampled twice during the open-water season of 1975 by means of a pontoon-equipped Huey helicopter. Each time, samples for physical and chemical parameters were collected from a number of depths at two stations on the lake (see map, page v). During each visit, a single depth-integrated (4.6 m to surface) sample was composited from the stations for phytoplankton identification and enumeration; and during the last visit, a single 18.9-liter depth-integrated sample was composited for algal assays. Also each time, a depth-integrated sample was collected from each of the stations for chlorophyll a analysis. The maximum depths sampled were 11.6 meters at station 1 and 40.2 meters at station 2.

The sampling results are presented in full in Appendix D and are summarized in the following table.

A. SUMMARY OF PHYSICAL AND CHEMICAL CHARACTERISTICS FOR MOON LAKE
STORET CODE 4910

| PARAMETER | 1ST SAMPLING ( 8/11/75) 2 SITES RANGE | MEAN | MEDIAN | 2ND SAMPLING ( 9/23/75) 2 SITES RANGE | MEAN | MEDIAN | 3RD SAMPLING 0 SITES RANGE | MEAN | MEDIAN |
|---|---|---|---|---|---|---|---|---|---|
| TEMP (C) | 6.0 - 17.5 | 12.9 | 13.9 | 10.8 - 14.2 | 13.2 | 13.7 | ****** | ********** | |
| DISS OXY (MG/L) | 5.4 - 8.0 | 7.3 | 7.5 | 7.1 - 7.6 | 7.3 | 7.2 | ****** | ********** | |
| CNDCTVY (MCROMO) | 15. - 23. | 20. | 19. | 4. - 6. | 5. | 5. | ****** | ********** | |
| PH (STAND UNITS) | 7.7 - 9.3 | 8.5 | 8.4 | 7.0 - 8.9 | 7.8 | 7.8 | ****** | ********** | |
| TOT ALK (MG/L) | 10. - 14. | 11. | 10. | 10. - 84. | 19. | 10. | ****** | ********** | |
| TOT P (MG/L) | 0.008 - 0.017 | 0.010 | 0.008 | 0.004 - 0.014 | 0.007 | 0.006 | ****** | ********** | |
| ORTHO P (MG/L) | 0.002 - 0.003 | 0.002 | 0.002 | 0.002 - 0.005 | 0.002 | 0.002 | ****** | ********** | |
| NO2+NO3 (MG/L) | 0.020 - 0.060 | 0.029 | 0.020 | 0.020 - 0.060 | 0.026 | 0.020 | ****** | ********** | |
| AMMONIA (MG/L) | 0.020 - 0.020 | 0.020 | 0.020 | 0.020 - 0.020 | 0.020 | 0.020 | ****** | ********** | |
| KJEL N (MG/L) | 0.300 - 0.400 | 0.367 | 0.400 | 0.200 - 0.200 | 0.200 | 0.200 | ****** | ********** | |
| INORG N (MG/L) | 0.040 - 0.080 | 0.049 | 0.040 | 0.040 - 0.080 | 0.046 | 0.040 | ****** | ********** | |
| TOTAL N (MG/L) | 0.320 - 0.460 | 0.396 | 0.420 | 0.220 - 0.260 | 0.226 | 0.220 | ****** | ********** | |
| CHLRPYL A (UG/L) | 2.5 - 3.1 | 2.8 | 2.8 | 2.6 - 2.6 | 2.6 | 2.6 | ****** | ********** | |
| SECCHI (METERS) | 3.5 - 3.8 | 3.7 | 3.7 | 2.4 - 2.4 | 2.4 | 2.4 | ****** | ********** | |

B. Biological Characteristics:

1. Phytoplankton -

| Sampling Date | Dominant Genera | Algal Units per ml |
|---|---|---|
| 08/11/75 | 1. Chroomonas (?) sp. | 69 |
| | 2. Asterionella sp. | 34 |
| | 3. Pennate diatoms | 34 |
| | Total | 137 |
| 09/23/75 | 1. Cyclotella sp. | 251 |
| | 2. Pennate diatoms | 126 |
| | 3. Asterionella sp. | 42 |
| | 4. Dinobryon sp. | 42 |
| | Total | 461 |

2. Chlorophyll a -

| Sampling Date | Station Number | Chlorophyll a (µg/l) |
|---|---|---|
| 08/11/75 | 1 | 2.5 |
| | 2 | 3.1 |
| 09/23/75 | 1 | 2.6 |
| | 2 | 2.6 |

C. Limiting Nutrient Study:

1. Autoclaved, filtered, and nutrient spiked -

| Spike (mg/l) | Ortho P Conc. (mg/l) | Inorganic N Conc. (mg/l) | Maximum yield (mg/l-dry wt.) |
|---|---|---|---|
| Control | 0.005 | 0.110 | 0.2 |
| 0.050 P | 0.055 | 0.110 | 7.6 |
| 0.050 P + 1.0 N | 0.055 | 1.110 | 18.5 |
| 1.0 N | 0.005 | 1.110 | 0.2 |

2. Discussion -

The control yield of the assay alga, Selenastrum capricornutum, indicates that the potential primary productivity

of Moon Lake was low at the time the sample was collected (09/23/75). Also, the significant increase in yield with the addition of phosphorus alone indicates that the lake was limited by phosphorus at that time.

The lake data also indicate phosphorus limitation; i.e., the mean inorganic nitrogen/orthophosphorus ratios were 23/1 or greater, and phosphorus limitation would be expected.

## IV. NUTRIENT LOADINGS
(See Appendix E for data)

For the determination of nutrient loadings, the Utah National Guard collected monthly near-surface grab samples when possible from each of the tributary sites indicated on the map (page v). Sampling was begun in November, 1974, and was completed in October, 1975.

Through an interagency agreement, stream flow estimates for the year of sampling and a "normalized" or average year were provided by the Utah District Office of the U.S. Geological Survey for the tributary sites nearest the lake.

In this report, nutrient loads for sampled tributaries were calculated using mean annual concentrations and mean annual flows. Nutrient loads for unsampled "minor tributaries and immediate drainage" ("ZZ" of U.S.G.S.) were estimated using the mean concentrations in Fish Creek at station B-1 and the mean annual ZZ flow.

No known wastewater treatment plants impacted Moon Lake during the sampling year.

A. Waste Sources:

1. Known municipal - None
2. Known industrial - None

B. Annual Total Phosphorus Loading - Average Year:

1. Inputs -

| Source | kg P/ yr | % of total |
|---|---|---|
| a. Tributaries (non-point load) - | | |
| Lake Fork River | 1,240 | 76.1 |
| Fish Creek | 80 | 4.9 |
| Brown Duck Creek | 210 | 12.9 |
| b. Minor tributaries & immediate drainage (non-point load) - | 45 | 2.7 |
| c. Known municipal STP's - None | - | - |
| d. Septic tanks - Unknown | ? | - |
| e. Known industrial - None | - | - |
| f. Direct precipitation* - | 55 | 3.4 |
| Total | 1,630 | 100.0 |

2. Outputs -

| | |
|---|---|
| Lake outlet - Lake Fork Creek | 1,610 |

3. Net annual P accumulation - 20 kg.

* See Working Paper No. 175.

C. Annual Total Nitrogen Loading - Average Year:

1. Inputs -

| Source | kg N/yr | % of total |
|---|---|---|
| a. Tributaries (non-point load) - | | |
| Lake Fork Creek | 128,985 | 88.7 |
| Fish Creek | 4,240 | 2.9 |
| Brown Duck Creek | 6,335 | 4.4 |
| b. Minor tributaries & immediate drainage (non-point load) - | 2,515 | 1.7 |
| c. Known municipal STP's - None | - | - |
| d. Septic tanks - Unknown | ? | - |
| e. Known industrial - None | - | - |
| f. Direct precipitation* - | 3,370 | 2.3 |
| Total | 145,445 | 100.0 |

2. Outputs -

Lake outlet - Lake Fork Creek 65,495

3. Net annual N accumulation - 79,950 kg.

D. Non-point Nutrient Export by Subdrainage Area:

| Tributary | kg P/km$^2$/yr | kg N/km$^2$/yr |
|---|---|---|
| Lake Fork Creek | 6 | 639 |
| Fish Creek | 3 | 164 |
| Brown Duck Creek | 6 | 175 |

* See Working Paper No. 175.

E. Yearly Loads:

In the following table, the existing phosphorus loadings are compared to those proposed by Vollenweider (Vollenweider and Dillon, 1974). Essentially, his "dangerous" loading is one at which the receiving water would become eutrophic or remain eutrophic; his "permissible" loading is that which would result in the receiving water remaining oligotrophic or becoming oligotrophic if morphometry permitted. A mesotrophic loading would be considered one between "dangerous" and "permissible".

Note that Vollenweider's model may not be applicable to water bodies with short hydraulic retention times.

| | Total Phosphorus | | Total Nitrogen | |
|---|---|---|---|---|
| | Total | Accumulated | Total | Accumulated |
| grams/$m^2$/yr | 0.52 | <0.01 | 46.6 | 25.6 |

| Vollenweider phosphorus loadings ($g/m^2/yr$) based on mean depth and mean hydraulic retention time of Moon Lake: | |
|---|---|
| "Dangerous" (eutrophic loading) | 1.16 |
| "Permissible" (oligotrophic loading) | 0.58 |

## V. LITERATURE REVIEWED

Sudweeks, Calvin K., 1975. Personal communication (lake morphometry). UT Bur. of Env. Health, Salt Lake City.

Vollenweider, R. A., and P. J. Dillon, 1974. The application of the phosphorus loading concept to eutrophication research. Natl. Res. Council of Canada Publ. No. 13690, Canada Centre for Inland Waters, Burlington, Ontario.

# VI. APPENDICES

## APPENDIX A

## LAKE RANKINGS

LAKE DATA TO BE USED IN RANKINGS

| LAKE CODE | LAKE NAME | MEDIAN TOTAL P | MEDIAN INORG N | 500-MEAN SEC | MEAN CHLORA | 15-MIN DO | MEDIAN DISS ORTHO P |
|---|---|---|---|---|---|---|---|
| 0406 | LAKE POWELL | 0.010 | 0.410 | 339.830 | 3.081 | 13.800 | 0.007 |
| 4901 | BEAR LAKE | 0.011 | 0.040 | 253.167 | 0.945 | 9.200 | 0.003 |
| 4902 | LOWER BOWN'S RESERVOIR | 0.031 | 0.040 | 336.000 | 5.567 | 9.400 | 0.006 |
| 4903 | DEER CREEK RESERVOIR | 0.038 | 0.215 | 430.333 | 9.078 | 14.800 | 0.006 |
| 4904 | ECHO RESERVOIR | 0.047 | 0.170 | 450.333 | 6.967 | 14.000 | 0.012 |
| 4905 | LYNN RESERVOIR | 0.121 | 0.200 | 417.667 | 39.600 | 10.400 | 0.052 |
| 4906 | FISH LAKE | 0.023 | 0.040 | 152.000 | 12.483 | 10.400 | 0.004 |
| 4907 | HUNTINGTON NORTH RESERVO | 0.013 | 0.040 | 392.000 | 1.900 | 7.800 | 0.005 |
| 4908 | JOE'S VALLEY RESERVOIR | 0.012 | 0.045 | 400.000 | 2.483 | 11.200 | 0.003 |
| 4909 | MINERSVILLE RESERVOIR | 0.192 | 0.060 | 445.000 | 33.583 | 8.600 | 0.107 |
| 4910 | MOON LAKE | 0.008 | 0.040 | 381.000 | 2.700 | 9.600 | 0.002 |
| 4911 | NAVAJO LAKE | 0.016 | 0.040 | 368.000 | 2.000 | 6.000 | 0.003 |
| 4912 | NEWCASTLE RESERVOIR | 0.051 | 0.040 | 428.667 | 12.467 | 13.600 | 0.009 |
| 4913 | OTTER CREEK RESERVOIR | 0.067 | 0.040 | 453.667 | 11.767 | 10.600 | 0.033 |
| 4914 | PANGUITCH LAKE | 0.071 | 0.040 | 426.500 | 45.950 | 14.200 | 0.010 |
| 4915 | PELICAN LAKE | 0.044 | 0.050 | 438.500 | 6.350 | 8.400 | 0.004 |
| 4916 | PINEVIEW RESERVOIR | 0.028 | 0.300 | 435.083 | 5.692 | 14.600 | 0.006 |
| 4917 | PIUTE RESERVOIR | 0.047 | 0.150 | 482.625 | 25.329 | 11.600 | 0.007 |
| 4918 | PORCUPINE RESERVOIR | 0.025 | 0.110 | 440.000 | 7.860 | 12.400 | 0.011 |
| 4919 | PRUESS RESERVOIR (GARRIS | 0.057 | 0.140 | 491.000 | 4.533 | 8.800 | 0.008 |
| 4920 | SEVIER BRIDGE RESERVOIR | 0.026 | 0.355 | 449.778 | 18.222 | 12.400 | 0.008 |
| 4921 | STARVATION RESERVOIR | 0.016 | 0.040 | 394.583 | 5.675 | 13.200 | 0.004 |
| 4922 | STEINAKER RESERVOIR | 0.011 | 0.040 | 316.750 | 1.844 | 12.600 | 0.005 |
| 4923 | TROPIC RESERVOIR | 0.021 | 0.050 | 425.000 | 7.200 | 8.400 | 0.006 |
| 4924 | UTAH LAKE | 0.132 | 0.320 | 490.583 | 72.012 | 11.400 | 0.012 |
| 4925 | WILLARD BAY RESERVOIR | 0.044 | 0.060 | 457.182 | 7.567 | 11.000 | 0.009 |
| 5605 | FLAMING GORGE RESERVOIR | 0.011 | 0.690 | 285.636 | 2.500 | 10.400 | 0.003 |

PERCENT OF LAKES WITH HIGHER VALUES (NUMBER OF LAKES WITH HIGHER VALUES)

| LAKE CODE | LAKE NAME | MEDIAN TOTAL P | MEDIAN INORG N | 500-MEAN SEC | MEAN CHLORA | 15-MIN DO | MEDIAN DISS ORTHO P | INDEX NO |
|---|---|---|---|---|---|---|---|---|
| 0408 | LAKE POWELL | 96 ( 25) | 4 ( 1) | 81 ( 21) | 73 ( 19) | 15 ( 4) | 42 ( 11) | 311 |
| 4901 | BEAR LAKE | 90 ( 23) | 87 ( 19) | 96 ( 25) | 100 ( 26) | 77 ( 20) | 90 ( 23) | 540 |
| 4902 | LOWER BOWN'S RESERVOIR | 46 ( 12) | 87 ( 19) | 85 ( 22) | 65 ( 17) | 73 ( 19) | 50 ( 13) | 406 |
| 4903 | DEER CREEK RESERVOIR | 42 ( 11) | 19 ( 5) | 42 ( 11) | 35 ( 9) | 0 ( 0) | 58 ( 14) | 196 |
| 4904 | ECHO RESERVOIR | 31 ( 8) | 27 ( 7) | 19 ( 5) | 50 ( 13) | 12 ( 3) | 13 ( 3) | 152 |
| 4905 | LYNN RESERVOIR | 8 ( 2) | 23 ( 6) | 58 ( 15) | 8 ( 2) | 62 ( 15) | 4 ( 1) | 163 |
| 4906 | FISH LAKE | 62 ( 16) | 65 ( 16) | 100 ( 26) | 23 ( 6) | 62 ( 15) | 79 ( 20) | 391 |
| 4907 | HUNTINGTON NORTH RESERVO | 77 ( 20) | 65 ( 16) | 69 ( 18) | 92 ( 24) | 96 ( 25) | 69 ( 18) | 468 |
| 4908 | JOE'S VALLEY RESERVOIR | 81 ( 21) | 58 ( 15) | 62 ( 16) | 85 ( 22) | 46 ( 12) | 96 ( 25) | 428 |
| 4909 | MINERSVILLE RESERVOIR | 0 ( 0) | 44 ( 11) | 27 ( 7) | 12 ( 3) | 85 ( 22) | 0 ( 0) | 168 |
| 4910 | MOON LAKE | 100 ( 26) | 87 ( 19) | 73 ( 19) | 77 ( 20) | 69 ( 18) | 100 ( 26) | 506 |
| 4911 | NAVAJO LAKE | 69 ( 18) | 87 ( 19) | 77 ( 20) | 88 ( 23) | 100 ( 26) | 85 ( 22) | 506 |
| 4912 | NEWCASTLE RESERVOIR | 23 ( 6) | 87 ( 19) | 46 ( 12) | 27 ( 7) | 19 ( 5) | 27 ( 7) | 229 |
| 4913 | OTTER CREEK RESERVOIR | 15 ( 4) | 87 ( 19) | 15 ( 4) | 31 ( 8) | 54 ( 14) | 8 ( 2) | 210 |
| 4914 | PANGUITCH LAKE | 12 ( 3) | 65 ( 16) | 50 ( 13) | 4 ( 1) | 8 ( 2) | 23 ( 6) | 162 |
| 4915 | PELICAN LAKE | 37 ( 9) | 54 ( 14) | 35 ( 9) | 54 ( 14) | 90 ( 23) | 73 ( 19) | 343 |
| 4916 | PINEVIEW RESERVOIR | 50 ( 13) | 15 ( 4) | 38 ( 10) | 58 ( 15) | 4 ( 1) | 58 ( 14) | 223 |
| 4917 | PIUTE RESERVOIR | 27 ( 7) | 31 ( 8) | 8 ( 2) | 15 ( 4) | 38 ( 10) | 46 ( 12) | 165 |
| 4918 | PORCUPINE RESERVOIR | 58 ( 15) | 38 ( 10) | 31 ( 8) | 38 ( 10) | 33 ( 8) | 19 ( 5) | 217 |
| 4919 | PRUESS RESERVOIR (GARRIS | 19 ( 5) | 35 ( 9) | 0 ( 0) | 69 ( 18) | 81 ( 21) | 37 ( 9) | 241 |
| 4920 | SEVIER BRIDGE RESERVOIR | 54 ( 14) | 8 ( 2) | 23 ( 6) | 19 ( 5) | 33 ( 8) | 37 ( 9) | 174 |
| 4921 | STARVATION RESERVOIR | 73 ( 19) | 87 ( 19) | 65 ( 17) | 62 ( 16) | 23 ( 6) | 79 ( 20) | 389 |
| 4922 | STEINAKER RESERVOIR | 85 ( 22) | 87 ( 19) | 88 ( 23) | 96 ( 25) | 27 ( 7) | 65 ( 17) | 448 |
| 4923 | TROPIC RESERVOIR | 65 ( 17) | 50 ( 13) | 54 ( 14) | 46 ( 12) | 90 ( 23) | 58 ( 14) | 363 |
| 4924 | UTAH LAKE | 4 ( 1) | 12 ( 3) | 4 ( 1) | 0 ( 0) | 42 ( 11) | 13 ( 3) | 75 |
| 4925 | WILLARD BAY RESERVOIR | 37 ( 9) | 44 ( 11) | 12 ( 3) | 42 ( 11) | 50 ( 13) | 31 ( 8) | 216 |
| 5605 | FLAMING GORGE RESERVOIR | 90 ( 23) | 0 ( 0) | 92 ( 24) | 81 ( 21) | 62 ( 15) | 90 ( 23) | 415 |

LAKES RANKED BY INDEX NOS.

| RANK | LAKE CODE | LAKE NAME | INDEX NO |
|---|---|---|---|
| 1 | 4901 | BEAR LAKE | 540 |
| 2 | 4911 | NAVAJO LAKE | 506 |
| 3 | 4910 | MOON LAKE | 506 |
| 4 | 4907 | HUNTINGTON NORTH RESERVO | 468 |
| 5 | 4922 | STEINAKER RESERVOIR | 448 |
| 6 | 4908 | JOE'S VALLEY RESERVOIR | 428 |
| 7 | 5605 | FLAMING GORGE RESERVOIR | 415 |
| 8 | 4902 | LOWER BOWN'S RESERVOIR | 406 |
| 9 | 4906 | FISH LAKE | 391 |
| 10 | 4921 | STARVATION RESERVOIR | 389 |
| 11 | 4923 | TROPIC RESERVOIR | 363 |
| 12 | 4915 | PELICAN LAKE | 343 |
| 13 | 0408 | LAKE POWELL | 311 |
| 14 | 4919 | PRUESS RESERVOIR (GARRIS | 241 |
| 15 | 4912 | NEWCASTLE RESERVOIR | 229 |
| 16 | 4916 | PINEVIEW RESERVOIR | 223 |
| 17 | 4918 | PORCUPINE RESERVOIR | 217 |
| 18 | 4925 | WILLARD BAY RESERVOIR | 216 |
| 19 | 4913 | OTTER CREEK RESERVOIR | 210 |
| 20 | 4903 | DEER CREEK RESERVOIR | 196 |
| 21 | 4920 | SEVIER BRIDGE RESERVOIR | 174 |
| 22 | 4909 | MINERSVILLE RESERVOIR | 168 |
| 23 | 4917 | PIUTE RESERVOIR | 165 |
| 24 | 4905 | LYNN RESERVOIR | 163 |
| 25 | 4914 | PANQUITCH LAKE | 162 |
| 26 | 4904 | ECHO RESERVOIR | 152 |
| 27 | 4924 | UTAH LAKE | 75 |

# APPENDIX B

## CONVERSION FACTORS

## CONVERSION FACTORS

Hectares x 2.471 = acres

Kilometers x 0.6214 = miles

Meters x 3.281 = feet

Cubic meters x $8.107 \times 10^{-4}$ = acre/feet

Square kilometers x 0.3861 = square miles

Cubic meters/sec x 35.315 = cubic feet/sec

Centimeters x 0.3937 = inches

Kilograms x 2.205 = pounds

Kilograms/square kilometer x 5.711 = lbs/square mile

# APPENDIX C

## TRIBUTARY FLOW DATA

TRIBUTARY FLOW INFORMATION FOR UTAH 10/18/76

LAKE CODE 4910 MOON LAKE

TOTAL DRAINAGE AREA OF LAKE(SQ KM) 290.1

| TRIBUTARY | SUB-DRAINAGE AREA(SQ KM) | NORMALIZED FLOWS(CMS) JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | MEAN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4910A1 | 290.1 | 0.0 | 0.028 | 0.085 | 1.642 | 8.212 | 9.911 | 10.194 | 7.362 | 4.248 | 1.557 | 0.255 | 0.0 | 3.650 |
| 4910A2 | 202.0 | 0.76 | 0.68 | 0.68 | 1.30 | 7.65 | 14.44 | 5.95 | 2.78 | 1.84 | 1.30 | 1.05 | 0.88 | 3.28 |
| 4910B1 | 25.9 | 0.042 | 0.042 | 0.042 | 0.071 | 0.396 | 0.793 | 0.311 | 0.156 | 0.099 | 0.071 | 0.057 | 0.042 | 0.177 |
| 4910C1 | 36.3 | 0.057 | 0.057 | 0.057 | 0.142 | 0.595 | 0.680 | 0.566 | 0.595 | 0.170 | 0.113 | 0.057 | 0.057 | 0.264 |
| 4910ZZ | 25.9 | 0.023 | 0.023 | 0.023 | 0.042 | 0.227 | 0.481 | 0.198 | 0.085 | 0.057 | 0.042 | 0.034 | 0.028 | 0.105 |

SUMMARY

TOTAL DRAINAGE AREA OF LAKE = 290.1
SUM OF SUB-DRAINAGE AREAS = 290.1
TOTAL FLOW IN = 45.83
TOTAL FLOW OUT = 43.49

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

| TRIBUTARY | MONTH | YEAR | MEAN FLOW | DAY | FLOW | DAY | FLOW | DAY | FLOW |
|---|---|---|---|---|---|---|---|---|---|
| 4910A1 | 11 | 74 | 0.0 | 15 | 0.0 | | | | |
| | 12 | 74 | 0.0 | 16 | 0.0 | | | | |
| | 1 | 75 | 0.0 | 13 | 0.0 | 16 | 0.0 | | |
| | 2 | 75 | 0.0 | 11 | 0.0 | | | | |
| | 3 | 75 | 0.0 | 19 | 0.0 | | | | |
| | 4 | 75 | 0.025 | | | | | | |
| | 5 | 75 | 8.155 | 15 | 8.580 | | | | |
| | 6 | 75 | 6.145 | 10 | 5.918 | | | | |
| | 7 | 75 | 15.716 | 31 | 7.730 | | | | |
| | 8 | 75 | 8.438 | 13 | 9.883 | | | | |
| | 9 | 75 | 7.192 | 30 | 5.239 | | | | |
| | 10 | 75 | 2.209 | 2 | 4.870 | | | | |
| 4910A2 | 11 | 74 | 0.892 | 14 | 0.821 | | | | |
| | 12 | 74 | 0.767 | 16 | 0.765 | | | | |
| | 1 | 75 | 0.708 | | | | | | |
| | 2 | 75 | 0.665 | 11 | 0.680 | | | | |
| | 3 | 75 | 0.637 | 19 | 0.623 | | | | |
| | 4 | 75 | 0.623 | 24 | 0.708 | | | | |
| | 5 | 75 | 2.223 | 28 | 3.030 | | | | |
| | 6 | 75 | 16.792 | 11 | 12.912 | | | | |
| | 7 | 75 | 16.395 | 31 | 7.674 | | | | |
| | 8 | 75 | 3.625 | 13 | 4.191 | | | | |
| | 9 | 75 | 1.495 | 2 | 1.699 | | | | |
| | 10 | 75 | 1.181 | 2 | 1.189 | | | | |

# TRIBUTARY FLOW INFORMATION FOR UTAH

LAKE CODE 4910 MOON LAKE

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

| TRIBUTARY | MONTH | YEAR | MEAN FLOW | DAY | FLOW | DAY | FLOW | DAY | FLOW |
|---|---|---|---|---|---|---|---|---|---|
| 491081 | 11 | 74 | 0.042 | 13 | 0.042 | | | | |
| | 12 | 74 | 0.042 | 16 | 0.042 | | | | |
| | 1 | 75 | 0.042 | | | | | | |
| | 2 | 75 | 0.042 | | | | | | |
| | 3 | 75 | 0.028 | 24 | 0.028 | | | | |
| | 4 | 75 | 0.311 | 28 | 0.425 | | | | |
| | 5 | 75 | 1.982 | 11 | 1.699 | | | | |
| | 6 | 75 | 1.416 | 31 | 0.340 | | | | |
| | 7 | 75 | 0.198 | | | | | | |
| | 8 | 75 | 0.085 | 2 | 0.113 | | | | |
| | 9 | 75 | 0.071 | 2 | 0.085 | | | | |
| | 10 | 75 | 0.142 | 14 | 0.142 | | | | |
| 4910C1 | 11 | 74 | 0.085 | 16 | 0.085 | | | | |
| | 12 | 74 | 0.085 | | | | | | |
| | 1 | 75 | 0.085 | | | | | | |
| | 2 | 75 | 0.085 | | | | | | |
| | 3 | 75 | 0.085 | | | | | | |
| | 4 | 75 | 0.311 | 28 | 0.425 | | | | |
| | 5 | 75 | 1.926 | 11 | 1.529 | | | | |
| | 6 | 75 | 1.699 | 31 | 0.538 | | | | |
| | 7 | 75 | 0.396 | 13 | 0.481 | | | | |
| | 8 | 75 | 0.142 | 30 | 0.113 | | | | |
| | 9 | 75 | 0.113 | | | | | | |
| | 10 | 74 | 0.020 | | | | | | |
| 4910ZZ | 11 | 74 | 0.017 | | | | | | |
| | 12 | 75 | 0.017 | | | | | | |
| | 1 | 75 | 0.014 | | | | | | |
| | 2 | 75 | 0.014 | | | | | | |
| | 3 | 75 | 0.014 | | | | | | |
| | 4 | 75 | 0.051 | | | | | | |
| | 5 | 75 | 0.396 | | | | | | |
| | 6 | 75 | 0.368 | | | | | | |
| | 7 | 75 | 0.085 | | | | | | |
| | 8 | 75 | 0.034 | | | | | | |
| | 9 | 75 | 0.028 | | | | | | |
| | 10 | | | | | | | | |

# APPENDIX D

## PHYSICAL and CHEMICAL DATA

STORET RETRIEVAL DATE 76/08/12

491001
40 33 14.0 110 29 24.0 3
MOON LAKE
49013 UTAH

11EPALES 2111202
0042 FEET DEPTH CLASS 00

| DATE FROM TO | TIME OF DAY | DEPTH FEET | 00010 WATER TEMP CENT | 00300 DO MG/L | 00077 TRANSP SECCHI INCHES | 00094 CNDUCTVY FIELD MICROMHO | 00400 PH SU | 00410 T ALK CACO3 MG/L | 00610 NH3-N TOTAL MG/L | 00625 TOT KJEL N MG/L | 00630 NO2&NO3 N-TOTAL MG/L | 00671 PHOS-DIS ORTHO MG/L P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 75/08/11 | 14 20 | 0000 | 17.0 | 7.6 | 138 | 22 | 9.35 | 14 | 0.020K | 0.300 | 0.020 | 0.003 |
| | 14 20 | 0005 | 16.3 | 8.0 | | 21 | 9.00 | 11 | 0.020K | 0.300 | 0.020K | 0.002 |
| | 14 20 | 0016 | 16.1 | 5.4 | | 19 | 9.20 | 10 | 0.020K | 0.400 | 0.020K | 0.002 |
| | 14 20 | 0030 | 12.2 | 7.6 | | 19 | 8.70 | 10K | 0.020K | 0.300 | 0.020K | 0.003 |
| | 14 20 | 0038 | 8.9 | 6.4 | | 15 | 8.40 | 10 | 0.020K | 0.400 | 0.040 | 0.003 |
| 75/09/23 | 14 20 | 0000 | 14.1 | 7.2 | 94 | 4 | 8.90 | 10K | 0.020K | 0.200K | 0.020K | 0.002K |
| | 14 20 | 0005 | 13.8 | 7.2 | | 5 | 8.60 | 14 | 0.020K | 0.200 | 0.020K | 0.002K |
| | 14 20 | 0015 | 13.6 | 7.4 | | 4 | 8.25 | 16 | 0.020K | 0.200K | 0.020K | 0.002 |
| | 14 20 | 0038 | 13.2 | 7.2 | | 5 | 8.00 | 17 | 0.020K | 0.200K | 0.020K | 0.002K |

| DATE FROM TO | TIME OF DAY | DEPTH FEET | 00665 PHOS-TOT MG/L P | 32217 CHLRPHYL A UG/L | 00031 INCDT LT REMNING PERCENT |
|---|---|---|---|---|---|
| 75/08/11 | 14 20 | 0000 | 0.008 | 2.5 | |
| | 14 20 | 0005 | 0.008 | | |
| | 14 20 | 0016 | 0.008 | | |
| | 14 20 | 0030 | 0.009 | | |
| | 14 20 | 0038 | 0.010 | | |
| 75/09/23 | 14 20 | 0000 | 0.005 | 2.6 | |
| | 14 20 | 0005 | 0.008 | | |
| | 14 20 | 0015 | 0.007 | | |
| | 14 20 | 0038 | 0.007 | | |

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/08/12

491002
40 34 28.0 110 30 17.0 3
MOON LAKE
49013 UTAH

11EPALES 2111202
0135 FEET DEPTH CLASS 00

| DATE FROM TO | TIME OF DAY | DEPTH FEET | 00010 WATER TEMP CENT | 00300 DO MG/L | 00077 TRANSP SECCHI INCHES | 00094 CNDUCTVY FIELD MICROMHO | 00400 PH SU | 00410 T ALK CACO3 MG/L | 00610 NH3-N TOTAL MG/L | 00625 TOT KJEL N MG/L | 00630 NO2&NO3 N-TOTAL MG/L | 00671 PHOS-DIS ORTHO MG/L P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 75/08/11 | 14 50 | 0000 | 17.5 | 7.4 | 150 | 21 | 8.50 | 10 | 0.020K | 0.300 | 0.020K | 0.002 |
| | 14 50 | 0005 | 17.0 | 7.3 | | 23 | 8.40 | 11 | 0.020K | 0.400 | 0.020K | 0.003 |
| | 14 50 | 0016 | 15.7 | 7.2 | | 23 | 8.40 | 10K | 0.020K | 0.400 | 0.020K | 0.003 |
| | 14 50 | 0030 | 12.2 | 7.6 | | 19 | 8.20 | 10K | 0.020K | 0.400 | 0.020 | 0.002 |
| | 14 50 | 0050 | 8.2 | 7.6 | | 19 | 7.90 | 10K | 0.020K | 0.400 | 0.040 | 0.003 |
| | 14 50 | 0085 | 7.4 | 7.8 | | 19 | 7.80 | 10K | 0.020K | 0.400 | 0.050 | 0.002K |
| | 14 50 | 0132 | 6.0 | 7.4 | | 19 | 7.70 | 10K | 0.020K | 0.400 | 0.060 | 0.002K |
| 75/09/23 | 13 50 | 0000 | 14.0 | 7.6 | 94 | 6 | 7.90 | 84 | 0.020K | 0.200 | 0.020 | 0.005 |
| | 13 50 | 0005 | 14.2 | 7.4 | | 5 | 7.70 | 10K | 0.020K | 0.200K | 0.020K | 0.002K |
| | 13 50 | 0015 | 14.1 | 7.6 | | 4 | 7.60 | 10K | 0.020K | 0.200K | 0.020K | 0.002K |
| | 13 50 | 0030 | 13.4 | 7.2 | | 4 | 7.40 | 10K | 0.020K | 0.200K | 0.020K | 0.002K |
| | 13 50 | 0050 | 11.2 | 7.2 | | 4 | 7.10 | 10K | 0.020K | 0.200K | 0.040 | 0.002K |
| | 13 50 | 0089 | 10.8 | 7.1 | | 5 | 7.00 | 10K | 0.020K | 0.200K | 0.060 | 0.002K |

| DATE FROM TO | TIME OF DAY | DEPTH FEET | 00665 PHOS-TOT MG/L P | 32217 CHLRPHYL A UG/L | 00031 INCDT LT REMNING PERCENT |
|---|---|---|---|---|---|
| 75/08/11 | 14 50 | 0000 | 0.008 | 3.1 | |
| | 14 50 | 0005 | 0.008 | | |
| | 14 50 | 0016 | 0.008 | | |
| | 14 50 | 0030 | 0.009 | | |
| | 14 50 | 0050 | 0.014 | | |
| | 14 50 | 0085 | 0.015 | | |
| | 14 50 | 0132 | 0.017 | | |
| 75/09/23 | 13 50 | 0000 | 0.014 | 2.6 | |
| | 13 50 | 0005 | 0.006 | | |
| | 13 50 | 0015 | 0.004 | | |
| | 13 50 | 0030 | 0.005 | | |
| | 13 50 | 0050 | 0.006 | | |
| | 13 50 | 0089 | 0.008 | | |

K VALUE KNOWN TO BE
LESS THAN INDICATED

# APPENDIX E

## TRIBUTARY AND WASTEWATER TREATMENT PLANT DATA

STORET RETRIEVAL DATE 76/08/12

4910A1
40 33 23.0 110 29 02.0 4
LAKE FORK RIVER
49 7.5 LK FORK MTN
O/MOON LAKE
GAGE STATN .2 MI SE MOON LK LOWER SPLWAY
11EPALES 2111204
0000 FEET DEPTH CLASS 00

| DATE FROM TO | TIME OF DAY | DEPTH FEET | 00630 NO2&NO3 N-TOTAL MG/L | 00625 TOT KJEL N MG/L | 00610 NH3-N TOTAL MG/L | 00671 PHOS-DIS ORTHO MG/L P | 00665 PHOS-TOT MG/L P |
|---|---|---|---|---|---|---|---|
| 75/05/15 | 15 45 | | 0.110 | 0.100 | 0.015 | 0.005K | 0.010 |
| 75/06/10 | 16 00 | | 0.085 | 1.400 | 0.025 | 0.005 | 0.020 |
| 75/07/31 | 12 30 | | 0.045 | 0.250 | 0.025 | 0.010 | 0.010 |
| 75/08/13 | 17 00 | | 0.040 | 0.500 | 0.025 | 0.005 | 0.010K |
| 75/09/30 | 11 00 | | 0.017 | 0.300 | 0.017 | 0.005K | 0.020 |

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/08/12

4910A2
40 36 24.0 110 31 35.0 4
LAKE FORK RIVER
49 7.5 KIDNEY LAKE
T/MOON LAKE 110691
GAGE STATN 2.7 MI NW OF MOON LK CMPGRND
11EPALES 2111204
0000 FEET DEPTH CLASS 00

| DATE FROM TO | TIME OF DAY | DEPTH FEET | 00630 NO2&NO3 N-TOTAL MG/L | 00625 TOT KJEL N MG/L | 00610 NH3-N TOTAL MG/L | 00671 PHOS-DIS ORTHO MG/L P | 00665 PHOS-TOT MG/L P |
|---|---|---|---|---|---|---|---|
| 74/11/14 | 12 15 | | 0.150 | 3.600 | 0.115 | 0.005K | 0.010K |
| 75/05/28 | 13 30 | | 0.045 | 0.600 | 0.035 | 0.005K | 0.010K |
| 75/06/11 | 16 00 | | 0.045 | 2.000 | 0.540 | 0.005K | 0.010 |
| 75/07/31 | 12 00 | | 0.020 | 0.100 | 0.010 | 0.005K | 0.010K |
| 75/09/02 | 14 15 | | 0.050 | 0.200 | 0.085 | 0.005 | 0.010 |
| 75/10/02 | 11 30 | | 0.070 | 0.600 | 0.015 | 0.005K | 0.020 |

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/08/12

491081
40 34 15.0 110 29 13.0 4
FISH CREEK
49 7.5 LAKE FORK
T/MOON LAKE
BNK .7 MI N OF LOWER SPILLWAY
11EPALES 2111204
0000 FEET DEPTH CLASS 00

| DATE FROM TO | TIME OF DAY | DEPTH FEET | 00630 NO2&NO3 N-TOTAL MG/L | 00625 TOT KJEL N MG/L | 00610 NH3-N TOTAL MG/L | 00671 PHOS-DIS ORTHO MG/L P | 00665 PHOS-TOT MG/L P |
|---|---|---|---|---|---|---|---|
| 74/11/13 | 10 | 10 | 0.168 | 0.300 | 0.040 | 0.005K | 0.010K |
| 74/12/16 | 15 | 10 | 0.176 | 0.150 | 0.015 | 0.005K | 0.010K |
| 75/05/28 | 16 | 20 | 0.075 | 0.450 | 0.020 | 0.005K | 0.010K |
| 75/06/11 | 16 | 00 | 0.030 | 1.600 | 0.030 | 0.005K | 0.030 |
| 75/07/31 | 10 | 10 | 0.030 | 0.150 | 0.005 | 0.005K | 0.010K |
| 75/09/02 | 16 | 30 | 0.090 | 1.900 | 0.070 | 0.005K | 0.010K |
| 75/10/02 | 15 | 00 | 0.100 | 0.100K | 0.005 | 0.005K | 0.020 |

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/08/12

4910C1
40 34 00.0 110 31 00.0 4
BROWN DUCK CREEK
49 7.5 KIDNEY LAKE
T/MOON LAKE 110691
GAGE STATN 2.8 MI NW OF MOON LK CMPGRND
11EPALES 2111204
0000 FEET DEPTH CLASS 00

| DATE FROM TO | TIME OF DAY | DEPTH FEET | 00630 NO2&NO3 N-TOTAL MG/L | 00625 TOT KJEL N MG/L | 00610 NH3-N TOTAL MG/L | 00671 PHOS-DIS ORTHO MG/L P | 00665 PHOS-TOT MG/L P |
|---|---|---|---|---|---|---|---|
| 74/11/14 | 15 30 | | 0.120 | 1.800 | 0.035 | 0.005 | 0.010K |
| 74/12/16 | 14 15 | | 0.160 | 0.200 | 0.020 | 0.005K | 0.010K |
| 75/05/28 | 14 45 | | 0.070 | 0.800 | 0.030 | 0.005K | 0.010K |
| 75/06/11 | 17 20 | | 0.055 | 1.200 | 0.035 | 0.005K | 0.080 |
| 75/07/31 | 13 20 | | 0.015 | 0.150 | 0.010 | 0.005K | 0.010 |
| 75/08/13 | 17 30 | | 0.030 | 0.400 | 0.010 | 0.005 | 0.010 |
| 75/09/30 | 09 30 | | 0.075 | 0.250 | 0.015 | 0.005K | 0.042 |

K VALUE KNOWN TO BE
LESS THAN INDICATED

bc